

BRINKMANN-Horizontal End Suction Pumps

SBC820S...1120S



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Brinkmann–Horizontal End Suction Pumps Series SBC820S...1120S

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1 Indication to the manual

This operating manual gives basic instructions which are to be observed during installation, operation and maintenance of the pump. It is therefore imperative that this manual be read by the responsible personnel and operator prior to assembly and commissioning. It is always to be kept available at the installation site.

1.1 Identification of safety instructions in the operating manual

Safety instructions given in this manual non-compliance with which would affect **safety** are identified by the following symbol



Safety sign according with ISO 3864–B.3.1

or where **electrical safety** is involved, with:



Safety sign according with ISO 3864–B.3.6

Where non-compliance with the safety instructions may cause a risk to the machine and it's function the word

ATTENTION

is inserted.

2 Description of the Product

2.1 General description of the pump

Pumps of the series SBC are one-stage rotary pumps. The impellers are fixed on the driving shaft extension. The pump shaft and motor shaft are interconnected by means of a shaft clamp.

The cutting unit is cutting the chips and the semi-open impeller with its large clearances allows to pump the particles along with the coolant fluid from the machine back to the filter. The SBC pumps are capable of handling chip to coolant ratios of up to 1.5% by weight. Pump and motor form a compact and space-saving unit. All pumps are equipped with double mechanical seal.

These pumps are for horizontal installations next to or underneath a tank. The pumps are foot mounted and must be screwed down in order to ensure a secure stance.

2.2 Intended use

These pumps are not self-priming and must be gravity fed. They are suited for cutting aluminum chips or similar materials and for pumping these materials along with the coolant fluid. An agitator located at the pump suction helps to break up and separate any large bundles of chips or birds' nests which reach the pump suction.

Pay attention of the limit of application in table 1.

Limit of Application (Table 1)

Type	SBC
Mediums	Coolants Cooling- and cutting-oil upon request
Flashing point of the medium to be pumped	$\geq 302\text{ }^{\circ}\text{F}$ ($150\text{ }^{\circ}\text{C}$)
Chip material	Aluminum max. chip to coolant ratio 1.5 %
Chip geometry	Chip bundles to max. Ø 3.94 Inch (100 mm)
Kinetic viscosity of the medium	...200SSU (...45 mm ² /s)
Temperature of medium	30 ... 175 °F (0 ... 80 °C)
min. delivery volume	1.5 % of Q max.
Dry running	Dry running causes increased wear and should be avoided. During the test of the direction of rotation (< 30 s) permissible.
Switching-on frequency per hour	The pump SBC should be operated in continual operation mode, not pulsed mode.
Ambient temperature	104 °F (40 °C)
Set-up altitude	3280 ft (1000 m)

ATTENTION

The pumps are to be operated within their design limits. Applications outside of these limits are not approved. The manufacturer is not responsible for any damages resulting from use of the pumps in such applications.

2.3 Technical data

Type	Max. del. Pressure spec. weight 1		Max. del. volume		Dimensions		Length	Weight	Power	
	PSI	bar	GPM	l/min	H Inch	h Inch	l Inch	Lbs	HP	kW
SBC820S	58	1.7	260	1000	30.0	20.4	12.2	157	5.4	4.0
SBC1120S	70	2.1	310	1150	31.4	20.4	13.6	205	7.4	5.5

Pipe connection: Suction Port DN125 / PN16

Discharge Port NPT2 (G2)

The motor is surface-cooled and compliant with DIN IEC 34 and EN 60034 (protection degree IP 55).

3 Safety instructions

When operating the pump, the safety instructions contained in this manual, the relevant national accident prevention regulations and any other service and safety instructions issued by the plant operator are to be observed.

3.1 Hazards in the event of non-compliance with the safety instructions

Non-compliance with the safety instructions may produce a risk to the personnel as well as to the environment and the machine and results in a loss of any right to claim damages.

For example, non-compliance may involve the following hazards:

- Failure of important functions of the machines/plant
- Failure of specified procedures of maintenance and repair
- Exposure of people to electrical, mechanical and chemical hazards
- Endangering the environment due to hazardous substances being released

3.2 Unauthorized modes of operation



- Pump may not be used in potentially explosive environments!
- Pump and discharge piping are not designed to hold any weight and may not be used as a step ladder.

3.3 Remaining Risk



Risk of Injury!

Risk of squeezing or crushing body parts when installing or removing the pump exists. Proper and secured lifting tools must be used.

Risk of burns!

The pump must have cooled down sufficiently prior to commencing any repair, maintenance or installation.

3.4 Qualification and training of operating personnel

The personnel responsible for operation, maintenance, inspection and assembly must be adequately qualified. Scope of responsibility and supervision of the personnel must be exactly defined by the plant operator. If the staff does not have the necessary knowledge, they must be trained and instructed, which may be performed by the machine manufacturer or supplier on behalf of the plant operator. Moreover, the plant operator is to make sure that the contents of the operating manual are fully understood by the personnel.

3.5 Safety instructions relevant for operation

- If hot or cold machine components involve hazards, they must be guarded against accidental contact.
- Guards for moving parts (e.g. coupling) must not be removed from the machine while in operation.
- Any leakage of hazardous (e.g. explosive, toxic, hot) fluids (e.g. from the shaft seal) must be drained away so as to prevent any risk to persons or the environment. Statutory regulations are to be complied with.
- Hazards resulting from electricity are to be prevented (see for example, the VDE Specifications and the bye-laws of the local power supply utilities).
- The pumps are only secured safely if properly attached to the floor or underneath a tank.
- The female threads on the motor MUST NOT be used to lift the entire pump and motor assembly.

3.6 Safety instructions relevant for maintenance, inspection and assembly work

Any work on the machine shall only be performed when it is at a standstill, it being imperative that the procedure for shutting down the machine described in this manual be followed.

Pumps and pump units which convey hazardous media must be decontaminated.

On completion of work all safety and protective facilities must be re-installed and made operative again.

Prior to restarting the machine, the instructions listed under "Start up" are to be observed.

3.7 Signs on the pump

It is imperative that signs affixed to the machine, e.g.:

- arrow indicating the direction of rotation
- symbols indicating fluid connections be observed and kept legible.

5.2 Electric wiring



All service work must be carried out by qualified service personnel. Pump must be disconnected from the power source and all rotating parts must stand still. Reassure that pump is disconnected from power source and cannot be switched on. Verify that there is no voltage at the terminal board!

According to the European Standard EN809 a motor overload must be installed and properly set to the full load amps stated on the pump name plate.

It is the responsibility of the machine operator to decide whether or not an additional emergency switch must be installed.

5.2.1 Circuit



Tension voltage and frequency must correspond with the shown specification on the nameplate.

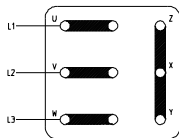
The pump must be wired so that a solid longterm electrical connection is ensured. Establish a solid ground connection.

The electrical wiring must be performed according to the wiring diagram shown inside the terminal box cover. (Please see above sample wiring diagrams)

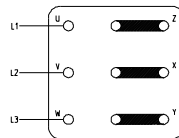
Wiring diagram e.g.

Voltage changing 1:2 YY / Y

e.g. 230 / 460 V, 60 Hz



YY
Low Voltage



Y
High Voltage

There may be no foreign objects such as dirt, particles or humidity inside the terminal board.

Mount terminal board cover to motor tight against dust and humidity and close up all unused wiring ports.

ATTENTION

When Variable Frequency Drives are used interfering signals might occur.

Non-sinus shaped supply voltage from a variable frequency drive might result in elevated motor temperatures.

6 Start up / Shut down

6.1 Start up

ATTENTION

Switch off at the mains.

After connection the electrical wires, close the terminal box.

Briefly start the motor (max. 30 sec.) and check the rotation according to the arrow on the top of the motor. If the direction is incorrect change over two of the power leads.

6.2 Shut down

All service work must be carried out by qualified service personnel. Pump must be disconnected from the power source and all rotating parts must stand still. Reassure that pump is disconnected from power source and cannot be switched on. Verify that there is no voltage at the terminal board!

Open terminal box and disconnect the power leads.

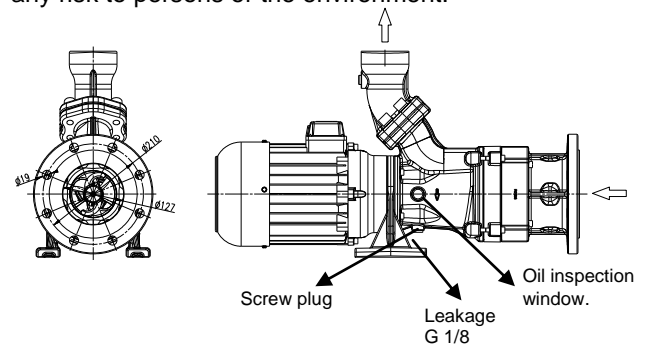
Empty out the pump.

7 Operation

Liquid level

These pumps are not self-priming and must be gravity fed.

Possible leakage must be drained away so as to prevent any risk to persons or the environment.



ATTENTION

The SBC pump should be operated in continual operation mode, not pulsed mode!

Pulsed mode causes increased wear due to the return flow of chips and additional load on the bearings

The pump should transport medium without chips for 1-2 minutes before being switched off!



The fluid level should be above the suction mouth of the pump during pumping of cooling- and cutting oils in order to avoid ignitions sparks. (Danger of fire and explosion if flammable aerosol is present!)

Unwanted objects, such as broken tools or indexing plates which still lie under the pump after stopping the working process must be taken out in regular intervals!

Any repair or maintenance work must be performed after the pump has been turned off and the shaft has come to a complete stop. Risk of injury!

See provided warning label!

If the pump should lock up and cease, shut pump down (see 6.2) and disconnect from power supply. Pump must be uninstalled and removed from the system prior to its repair.

8 Servicing and Maintenance

ATTENTION

The surface of the motor must be kept free of dirt.

The motor shaft is spinning in permanently greased ball bearings (with special grease and increased bearing play) and does not require any special maintenance.

9 Troubleshooting Guide

8.1 Pumps with double mechanical seal (-GD)

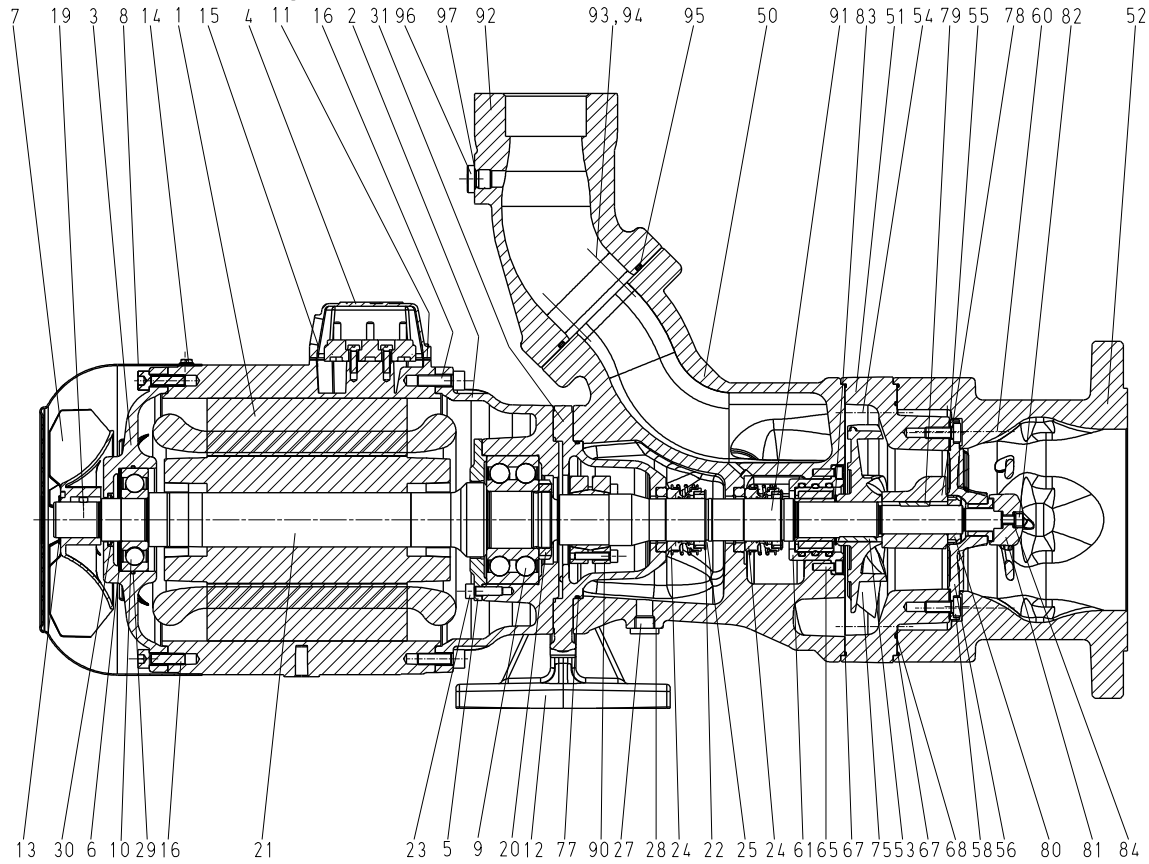
Pumps with double mechanical seal (-GD) are identified by the letters GLRD stamped in on the motor side of the pump foot and must include an oil receiver with a capacity of 0.45 litres. Check this through the inspection window.

Oil receiver Castrol WHITEMOR WOM14 or equivalent oil.

Fault	Cause	Remedy
Motor does not start, no motor noise	At least two of the power supply leads have failed	Check fuses, terminals and supply leads .
	Overload has tripped	Inspect overload
Motor does not start, humming noise	One of the supply leads has failed	See above
	Impeller faulty Motor bearing faulty	Replace impeller Replace bearing
Overload trips	Pump locked up mechanically High on/of cycling frequency	Inspect pump hydraulics Check application
Power consumption is too high	Wrong direction of rotation of impeller	See above
	Lime or other deposits mechanical friction	Clean pump mechanism repair pump
Motor overheats	High on/off cycling frequency Wrong power supply (voltage or cycles)	See above Power supply must correspond with name plate rating
	Insufficient cooling	Check air flow at motor fan
Pump does not pump	liquid level too low Pump mechanism faulty Pipe blocked	Fill up liquid replace pump mechanism Clean pipe
Insufficient flow and pressure	Wrong direction of rotation of impeller	Change over two power supply leads
	Pump mechanism silted up Worn pump mechanism	Clean pump mechanism Replace pump mechanism
Incorrect flow or pressure	Wrong power supply (voltage or cycles)	Power supply must correspond with name plate rating
Running noise/Vibration	Foreign objects in pump end	Remove foreign objects
	Impeller damaged	Replace impeller
	Bearing/Bushing broken	Replace bearing/bushing

10 Spare part

10.1 Spare part list for Brinkmann Horizontal End-Suction Pumps Series SBC820S...1120S



Item Description

1	Stator with terminal board	
2	Motor flange	
3	End shield	
4	Terminal box up to 5.4 HP	
4.1	Terminal box frame up 7.4 HP	
4.2	Terminal box cover up 7.4 HP	
5	Bearing cover	
6	Compensation disk	
7	Fan	
8	Fan cover	
9	Ball bearing	DIN 628
10	Ball bearing	DIN 625
11	Gasket	
11.1	Gasket up 7.4 HP	
12	Pump foot	
13	Retaining ring	
14	Spiral-shaped screw	DIN 7500
15	Socket head cap screw	DIN 84
16	Socket head cap screw with lock	DIN 912
19	Parallel pin	DIN 7
20	Shaft nut	
21	Motor shaft with rotor	
22	Shim ring	
23	Socket head cap screw	DIN 912
24	Mechanical seal	
25	Circlip	
27	Oil inspection window	
27	Screw plug	DIN 908
28	Sealing ring	DIN 7603
29	O-ring	
30	Shaft seal	
31	Socket head cap screw with lock	DIN 912

Item Description

50	Pump body	
51	Intake cover	
52	Connection cover	
53	Woodruff key	DIN 6888
54	Socket head cap screw with lock	DIN 912
55	Shim ring	
56	Chip breaker with bearing bush	
58	Socket head cap screw with lock	DIN 7984
60	Socket head cap screw with lock	DIN 912
61	Bushing cartridge assembly	
65	Socket head cap screw	DIN 912
67	O-ring	
68	O-ring	
75	Impeller	
77	O-ring	
78	Suction screw	
79	Woodruff key	DIN 6888
80	Shaft nut	
81	Agitator	
82	Socket head cap screw with lock	DIN 912
83	Shim ring	
84	Serrated lock washer	
90	Shaft clamp	
91	Insert shaft	
92	Joining socket	
93	Socket head cap screw	DIN 912
94	Spring washer	DIN 7980
95	O-ring	
96	Screw plug	DIN 908
97	Sealing ring	DIN 7603

10.2 Indications to the spare part order

Spare parts are available from the supplier.
Standard commercially available parts are to be purchased in accordance with the model type.
The ordering of spare parts should contain the following details:

1. Pumptype

e.g. SBC1120S

2. Pump No.

e.g. 03146808

The date of the construction year is a component of the pumps type number.

3. Voltage, Frequency and Power

Take item 1, 2 and 3 from the nameplate

4. Spare part with item No.

e.g. connection cover item No. 52

11 Repair Instructions / Replacing the rotary mechanical seal / the shaft clamp

11.1 Replacing the rotary mechanical seal



Wear safety gloves!

Risk of injury due to sharp edges on pump components, i.e. impeller blades.

- 1) Disconnect the pump electrically and mechanically.
Note the markings on the pump components prior to dismantling. When completely dismantling a unit with dual axial face seals, drain the medium in the blocking chamber through the screw plug (27).
- 2) Loosen the socket head cap screws (60) and remove the connection cover (52).
- 3) Loosen the Socket head cap screws (82) and remove the agitator (81) with the Serrated lock washer (84).
- 4) Loosen the socket head cap screws (58) and remove the shim ring (55) and the chip breaker (56).
- 5) Loosen the shaft nut (80) and remove the suction screw (78).
- 6) Loosen the socket head cap screws (54) and remove the intake cover with o-ring (67).
- 7) Use two screwdrivers to push the impeller (75) from the insert shaft (91). Insert the screwdrivers between the impeller (75) and the pump body (50).
- 8) Remove the woodruff key (53) from the insert shaft (91). Loosen the socket head cap screws (65) and remove the bushing cartridge assembly (61) with the shim ring (83).
- 9) Remove the circlip (25) and the shim ring (22).
Remove the rotating axial face seal unit (24b-24e).
- 10) Loosen the Socket head cap screws (31) and remove the pump body (50).
- 11) Remove circlip (25) and shim ring (22) and remove the rotating axial face seal unit (24b-24e). To replace the insert shaft, see position

11.2).

When changing an axial face seal, remove the stationary axial face seal unit (24a) from the pump body (50) and pump foot (12). Clean the seat of the seal and the pump parts!

The mechanical seal (24) should now be completely replaced. If necessary replace the o-rings (67), (77) and impeller (75).

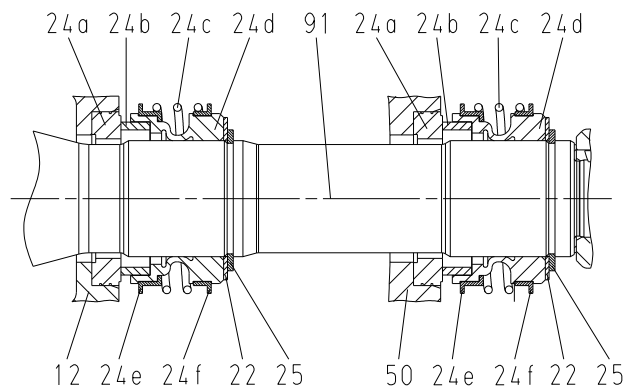
12) Fit a new mechanical seal.

The sliding surfaces of the axial face seal must be free of dirt and grease. Lightly moisten the collar (24a) with prill water and press the stationary axial face seal unit (24a) into the pump body (50) and pump foot (12). Slide the rotating axial face seal unit (24b-24e) onto insert shaft (91) and fix in position using shim ring (22) and circlip (25).

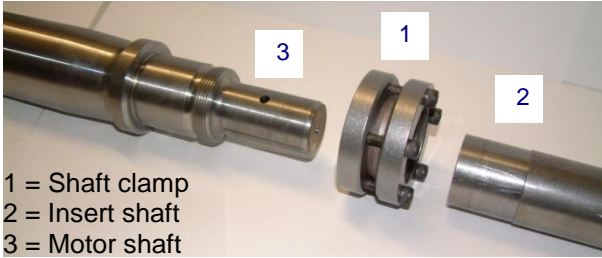
13) The remaining assembly steps are Pos 2) to 8) in reverse order.

ATTENTION

Assembly help and detailed instruction is demanded for the assembly of the pump and adjusting of the cutting unit!



11.2 Dismantling the insert shaft



- 1) Disconnect the inline pump from the mains both electrically and mechanically.
- 2) Remove the pump.
- 3) Empty out the Pump and dismantle the pump unit.



Wear safety gloves!

Risk of injury due to sharp edges on pump components, i.e. impeller blades.

- 4) Dismantle the pump body and the pump foot
- 5) Loosen the screws on the shaft clamp (1) one after the other.



Do not, under any circumstances, remove the screws completely, **danger of injury!**

- 6) Pull the extension shaft (2) and the shaft clamp (1) off the motor shaft (3).

11.3 Assembling the insert shaft and motor shaft

ATTENTION

Clean the contact surfaces of the insert shaft (2) (inside) and the motor shaft (3). They must not be lubricated or oiled.

- 7) Set the pump down on the end of the shaft.
- 8) Position the shaft clamp (1) (use a new shaft clamp) in the centre of the cranked clamping diameter (2) of the insert shaft.
- 9) Insert the motor shaft (3) into the insert shaft (2).
- 10) **Tighten:**
Mark the first screw and tighten all the screws evenly by hand, one after the other in a clockwise direction (not cross-ways).
- 11) Use a torque screwdriver to tighten each screw first with 1.5 ft. lbs. (2 Nm) then with 2.6 ft. lbs. (3.5 Nm) and finally with 3.7 ft. lbs. (5 Nm) (in a clock-wise direction again).

- 12) Mount the pump foot and the pump body.

The remainder of the reassembly process is to be completed in the opposite order of the prior described dismantling process.

ATTENTION

Note torques for the screw connections!

- 13) Position the pump laterally and fill the pump blocking chamber (-GD) with oil until it reaches the oil inspection window (27) (0.45 litres). Fit the sealing ring (28) and screw on the screw plug (27).

When putting the pump back into use, **make sure the direction of rotation is correct!**

Tightening torques for screwed connections

Thread - Ø	M5	M6		M8	M16
Strength classes	4.8	8.8	12.9	8.8	8.8
Tightening torque ft. lbs. (Nm)	2.2 (3)	3.3 (4.5)	11.7 (16) Item 82	15 (20)	44 (60)

12 Disposal

When disposing of the pump or the packaging materials the local and national regulation for proper disposal must be complied with.

Prior to its disposal, the pump must be completely drained and decontaminated if necessary.

13 WARRANTY

Brinkmann Pumps, Inc. warrants that the product contained herein conforms to the description in Brinkmann's catalog and that if this product shall fail to conform to the description thereof or to any express or implied warranty, Brinkmann shall, upon written notice of such nonconformity within one year of the date of its shipment from BRINKMANN'S plant, repair or replace such non-conforming material at the original point of delivery. Brinkmann will furnish instructions for disposition of the goods. If, however, Brinkmann provides a written warranty, as to this specific product, which is not in conformity to the above warranty, then as to such specific product, the specific written warranty shall prevail.

In addition to the warranty that this product will conform to the description in Brinkmann's catalog and that any such non-conforming material will be repaired or replaced, as above stated, BRINKMANN further warrants that it conveys good title to this product, free of all liens of any kind whatever unknown to the first Buyer. These are the sole warranties of BRINKMANN with respect to this product. BRINKMANN MAKES NO FURTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS ARE HEREBY DISCLAIMED BY BRINKMANN AND EXCLUDED FROM THIS SALE.

The Buyer's exclusive and sole remedy on account or in respect of the product herein contained that does not conform to the description thereof, or to any express or implied warranty, shall be to secure replacement thereof as aforesaid. BRINKMANN shall not in any event be liable for the cost of any labor expended on any such material or for any special, direct, indirect, incidental or consequential damages to anyone by reason of the fact that such goods do not conform to the description thereof or to any express or implied warranty.